

EXHIBIT B

Client Grayson WirelessInventor Martin Atkes, Joseph P. Kennedy Jr.,
John CarlsonSerial No. 10/586,744 Filed July 21, 2008Title System and Method for Identifying the Path
or Devices on the Path of a Communication

Assignee _____

Assignment Recorded _____ Reel _____ Frame _____

OFFICE ACTIONS

AMENDMENTS

Appn. filed 4-21-06

IDS filed 9-20-06

Status Inquiry 8-28-07

Assignment 11-16-07

Reexamination Notice 11-16-07

Status Inquiry 1/2/08

NOMP: 6/11/08 filed 8-11-08

NOMP Response filed 6/25/08

Acceptance Notice 7-2-08

Filing Receipt 7-2-08

Publn. notice

Abandonment notice 8-2-10

Petition to Withdraw abandonment filed 10-15-10

T0919-00063 Folder: 0001



F00805420

Client: GRAYSON WIRELESS

Matter: U.S. NATIONAL PHASE PATENT
APPLICATION TITLE: SYSTEM AND METHO
IDENTIFYING THE PATH OF DEVICES ON
THE PATH OF A COMMUNICATION SIGNAL
USING (1+R(T)) AMPLITUDE OUR

Folder: T0919-00063

Small Entity Status - Yes _____

Allowed _____

Patent No. _____

Priority Claimed _____

ENTERED PATRICIA
05/2007

Billing: COMTOIS, MARK C.

JFB:

DUANE MORRIS LLP

1667 K STREET NW SUITE 700

Atty Docket: GRA26 029US

Today's Date: July 21, 2006

In re the PCT Application of Martin ALLES, et al

International Application No.: PCT/US2005/016453- 016748 e.o.

U.S. Serial No.: Unassigned

File: HEREWITH

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON
THE PATH OF A COMMUNICATION SIGNALUSING (1+r(T))
AMPLITUDE MODULATION

The following has been received in the U.S. Patent & Trademark Office on the date stamped
hereon:

X	Transmittal Letter to the US Receiving Office (in duplicate)
X	Application Data Sheet
X	Specification 12 pgs, Claims 5 pgs. and an Abstract
X	Drawing 7 pgs. (Figures 1, 2A, 2B, 3, 4, 5, 6, 7, and 8))

Atty Docket: GRA26 029US

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Atty Docket: GRA26 029US

Today's Date: July 21, 2006

In re the PCT Application of Martin ALLES, et al

International Application No.: PCT/US2005/016453 DUANE MORRIS, LLP

U.S. Serial No.: Unassigned

File: HEREWITH

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON
THE PATH OF A COMMUNICATION SIGNALUSING (1+r(T))
AMPLITUDE MODULATION
10/586744

The following has been received in the U.S. Patent & Trademark Office on the date stamped
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1AP15 Rec'd PCT/PTO 21 JUL 2006

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371		ATTORNEY'S DOCKET NUMBER GRA26 029US U.S. APPLICATION NO. (If known, see 37 CFR 1.5) Unassigned
INTERNATIONAL APPLICATION NO. PCT/US2005/016748	INTERNATIONAL FILING DATE 11 May 2005	PRIORITY DATE CLAIMED 12 May 2004
TITLE OF INVENTION Sytem & Method for Identifying the Path or Devices on the Path of a Communication Signal Using (1+R(T)) Amplitude Modulation		
APPLICANT(S) FOR DO/EO/US Martin Alles, Joseph P. Kennedy, Jr., and John Peter Carlson		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a submission under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a submission under 35 U.S.C. 371. 3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below. 4. <input checked="" type="checkbox"/> The US has been elected (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). a. <input type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). Items 11 to 20 below concern document(s) or information included: 11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13. <input type="checkbox"/> A preliminary amendment. 14. <input type="checkbox"/> An Application Data Sheet under 37 CFR 1.76. 15. <input type="checkbox"/> A substitute specification. 16. <input type="checkbox"/> A power of attorney and/or change of address letter. 17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 37 CFR 1.821-1.825. 18. <input type="checkbox"/> A second copy of the published International Application under 35 U.S.C. 154(d)(4). 19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).		

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete, including gathering information, preparing, and submitting the completed form to the USPTO. Time will vary depending upon the size of the application. Any comments on the burden of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop-PCP, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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U.S. APPLICATION NO. (if known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO.		ATTORNEY'S DOCKET NUMBER	
		PCT/US2005/0167483		GRA26 029US	
20. Other Items or Information:					
The following fees have been submitted				CALCULATIONS PTO USE ONLY	
21. <input checked="" type="checkbox"/> Basic national fee (37 CFR 1.492(a))..... \$300				\$	300.00
22. <input checked="" type="checkbox"/> Examination fee (37 CFR 1.492(c))				\$	
If the written opinion prepared by ISA/US or the International preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)..... \$0				\$	
All other situations..... \$200				\$	200.00
23. <input type="checkbox"/> Search fee (37 CFR 1.492(b))				\$	
If the written opinion of the ISA/US or the International preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)..... \$0				\$	
Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority..... \$100				\$	100.00
International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB..... \$400				\$	
All other situations..... \$500				\$	
TOTAL OF 21, 22 and 23 =				\$	600.00
<input type="checkbox"/> Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) or computer program listing in an electronic medium) (37 CFR 1.492(i)). The fee is \$250 for each additional 50 sheets of paper or fraction thereof.					
Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof (round up to a whole number)	RATE		
- 100 =	/50 =		x \$250	\$	
Surcharge of \$130.00 for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	35 - 20 =	15	x \$ 50	\$	750.00
Independent claims	4 - 3 =	1	x \$200	\$	200.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$360	\$	0.00
TOTAL OF ABOVE CALCULATIONS =				\$	0.00
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. Fees above are reduced by 1/3.					
SUBTOTAL =				\$	1,550.00
Processing fee of \$130.00 for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(j)).				\$	
TOTAL NATIONAL FEE =				\$	1,550.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED =				\$	1,550.00
				Amount to be refunded.	\$
				Amount to be charged	\$

- a. ☒ A check in the amount of \$ 1550.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
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- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

SEND ALL CORRESPONDENCE TO:

DUANE MORRIS LLP
1667 K Street, N.W.
Suite 700
Washington, D.C. 20006
Telephone: 202.776.7800
Facsimile: 202.776.7801

SIGNATURE

Mark C. Comfois

NAME

46,285

REGISTRATION NUMBER

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Patent Application of: Martin ALLES, et al.

Serial No.: NEW NATIONAL STAGE APPLICATION
of PCT/US2005/016748

Art Unit: Unassigned

Filed: HERewith

Examiner: Unassigned

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON
THE PATH OF A COMMUNICATION SIGNAL USING (1+r(T)) AMPLITUDE
MODULATION

APPLICATION DATA SHEET

BOX PATENT APPLICATION

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Sir:

INVENTOR(S): ALLES, MARTIN
16 STONEHAVEN ROAD
HAMILTON PARISH
FLO4
BERMUDA

NATIONALITY: US

KENNEDY, JR., JOSEPH P.
11127 ELMVIEW PLACE
GREAT FALLS, VA 22066

NATIONALITY: US

INVENTOR(S): Cont'd.

CARLSON, JOHN PETER
43479 OGDEN PLACE
DULLES, VIRGINIA 20166

NATIONALITY: US

PRIORITY:

United States Provisional Application Serial No. 60/570,082, 60/570,081
and 60/570,067
Filed: 12 May 2004

Please address all correspondence and direct all inquires to:

Mark C. Comtois
DUANE MORRIS LLP
1667 K Street, N.W., Suite 700
Washington, DC 20006
Telephone: (202) 776-7800
Telecopier: (202) 776-7801

Customer No.: 39,290

Respectfully submitted,

DUANE MORRIS LLP
1667 K Street, N.W., Suite 700
Washington, DC 20006
Telephone: (202) 776-7800
Telecopier: (202) 776-7801

Mark C. Comtois	Reg. No. 46,285
D. Joseph English	Reg. No. 42,514
Patrick D. McPherson	Reg. No. 46,255

Dated: July 21, 2006

SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON THE PATH OF A COMMUNICATION SIGNAL USING $(1 + r(t))$ AMPLITUDE MODULATION

CROSS REFERENCES

[0001] This non-provisional Application claims priority benefit of co-pending Provisional Patent Application Serial No. 60/570,081, titled SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICE ON THE PATH OF A COMMUNICATION SIGNAL USING $(1 + r(t))$ AMPLITUDE MODULATION, filed May 12, 2004, the contents of which are herein incorporated by reference.

[0002] The present non-provisional application claims priority benefit of co-pending provisional application serial number 60/570,082, titled SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON THE PATH OF A COMMUNICATION SIGNAL filed May 12, 2004, the entirety of which is hereby incorporated by reference.

[0003] This non-provisional Application claims priority benefit of co-pending Provisional Patent Application Serial No. 60/570,067, titled SYSTEM AND METHOD FOR DETECTING A MOBILE STATION OPERATING THROUGH A REPEATER, filed May 12, 2004, the contents of which are herein incorporated by reference.

BACKGROUND

[0004] Applicant's disclosure is directed generally towards a wireless communications network for determining whether a signal from a mobile appliance is operated on by a repeater or other network device.

[0005] The use of wireless communication devices such as telephones, pagers, personal digital assistants, laptop computers, etc., hereinafter referred to collectively as "mobile appliances," has become prevalent in today's society.

[0006] Figure 1 shows a conventional mobile-appliance communication system having base stations 10 a-c for communicating with a mobile appliance 20. Each base station 10 contains signal processing equipment and an antenna for transmitting to and receiving signals from the mobile appliance 20 as well as other base stations. A Base Station Controller ("BSC")

and/or Mobile Switching Center ("MSC") 45 typically is connected to each base station 10 through a wire line connection 41.

[0007] To meet the ever growing demand for mobile communication, wireless communication systems deploy repeater stations to expand range and concentration of coverage. In Figure 1, a repeater 50a, associated with base station 10a, is located to extend the coverage area to encompass the back side of the mountain 1. The repeater 50b, associated with base station 10c, is mounted on a building and is used to provide service within the building 2.

[0008] Repeaters typically fall into two categories: (1) non-translating, also known as wideband, and (2) translating, also known as narrowband. As shown in Figure 2a, a non-translating repeater 250 simply passes the forward F_{fl} and reverse R_{fl} frequencies from the base station 210 and mobile appliance 220 respectively to and from the repeater coverage location. Often wideband repeaters are "in-building" or serve limited coverage areas. While the description of non-translating repeaters above and translating repeaters below are described in reference to frequency, their operation can equally be described in terms of channels, and the use of the term frequency should not be construed to limit the scope of the present disclosed subject matter.

[0009] A translating repeater assigns the mobile to a different traffic channel unbeknownst to the base station, mobile switch, MPC, and the base station controller. As shown in Figure 2b, the translating repeater uses the base station traffic channel R_{fl} for repeater 250 to base station 210 communication while the mobile appliance 220 utilizes a separate frequency R_{r} for mobile to repeater communications. Translating repeaters act similarly in the forward direction using F_{fl} from the base station 210 to the repeater station 250 and F_{r} from the repeater station 250 to the mobile appliance 220. In both cases, the existence of the repeater is usually transparent to the network.

[0010] The function of the repeater station can be assumed to be equivalent to converting all signals in some received bandwidth from a Radio Frequency (RF) to some Intermediate Frequency (IF). The IF signal bandwidth is then up-converted by suitably frequency shifting this bandwidth while concurrently applying both amplification and a fixed delay to the signals.

[0011] For example, let the set of signals transmitted by N mobiles in the repeaters' input bandwidth be denoted by $S(t) = \sum_{k=1}^N a(k)x(k,t)\sin(wt)$, where the signal from a given mobile is denoted by $x(k, t)$. The signal $x(k, t)$ is contained in the repeater bandwidth and w is the angular frequency center of the RF bandwidth. The repeater downshifts the aggregate signal to generate $D(t) = \sum_{k=1}^N a(k)x(k,t)\sin(vt)$, in which v is now representative of the center of the IF bandwidth. The entire signal $D(t)$ is now converted back to RF by operations that are equivalent to forming the signal $R(t + T) = G \sum_{k=1}^N a(k)x(k,t)\sin(vt)\cos(wt - vt) + G \sum_{k=1}^N a(k)x(k,t)\cos(vt)\sin(wt - vt)$, in which G is the repeater gain. The last equation can be written in a more convenient, mathematical manner by noting that $R(t)$ can be derived from $D(t)$ by writing it as $R(t + T) = \text{Re}\{G \exp(j(w - v)t)I(t)\}$, where $G \exp(j(w - v)t)$ is the complex representation of the multiplicative signal introduced by the repeater on the downshifted signal bandwidth and $I(t)$ is the complex representation of $D(t)$.

[0012] Essentially, the function of the repeater is to convert the RF signal to an IF signal, delay and amplify that IF signal, up-convert the signal back to RF, and transmit the signal. This is true for both translating and non-translating repeaters.

[0013] Repeaters typically communicate with the host base station via an RF link as shown in Figure 3 between base station 310 and repeater 350a. This connection allows remote operation of the repeater without physical ties back to the host base station, which is particularly advantageous in rugged or other areas where laying lines are difficult or costly. Some repeaters, generally non-translating repeaters, use a fiber optic or copper wire "tether" instead of an RF link to communicate with the host base station as shown in Figure 3, where base station 310 is connected to repeater station 350b by tether 351. RF signals are placed onto the tether at the repeater and then summed into the normal base station antenna path at the antenna feed interface 311 at the host base station. After integration into the normal base station antenna path, the signal from the repeater is indistinguishable to the base station regarding its origin (e.g., from the base station antennas or from a tether). In this tether architecture as well, the host base station has no knowledge of the repeater's existence or that a call is being served by the repeater.

[0014] Neither the base station nor the switch knows that a repeater or other network device is serving a call. For example, a repeater installed as an in-building distribution system would use indoor antennas to communicate with the indoor handsets and an outdoor antenna to communicate with the host base station. In order to accomplish this, there is a need to overcome the deficiencies in the prior art by employing a novel system and method that is capable of identifying when a mobile's signal is being received via a repeater or other network device.

[0015] In view of this need, it is an object of the disclosed subject matter to present a method for determining whether a signal is received directly from the mobile or from a repeater in the communication network.

[0016] These objects and other advantages of the disclosed subject matter will be readily apparent to one skilled in the art to which the disclosure pertains from a perusal of the claims, the appended drawings, and the following detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0017] Figure 1 is a prior art wireless communication system
- [0018] Figure 2a is an illustration of the operation of a prior art non-translating repeater station.
- [0019] Figure 2b is an illustration of the operation of a prior art translating repeater station.
- [0020] Figure 3 is an illustration of a prior art wireless communication system with repeater stations connected with an RF link and over a tether.
- [0021] Figure 4 is a representative flow chart for the operation of a repeater in an embodiment of the present subject matter.
- [0022] Figure 5 is a representative flow chart for the operation of a network analysis system according to an embodiment of the present subject matter.
- [0023] Figure 6 is a representative flow chart for determining whether an uplink signal is received from a repeater according to an embodiment of the present subject matter.
- [0024] Figure 7 is a schematic diagram of a repeater, mobile and network analysis system according to an embodiment of the present subject matter.
- [0025] Figure 8 is a schematic diagram of a repeater with a modification circuit according to an embodiment of the present subject matter.

DETAILED DESCRIPTION

[0026] An important aspect of the presently disclosed subject matter is a network analysis system can determine when a received signal from a mobile has passed through a repeater. Prior art systems do not have this capability and consequently treat all the signals received by the base station as having been received directly from the target mobile. For

example, the ability to determine if a signal from a mobile has passed through a repeater enables embodiments of the disclosed subject matter in a network analysis system to provide more efficient network management. The foregoing are exemplary only and shall not be used to limit the invention. These examples and others are discussed in more detail below.

[0027] The present subject matter relates to the case where signals can be received at base stations, or other receivers, either directly from the mobile appliance or through a repeater. The ability to discern the difference between direct signals and repeated signals (i.e., signals that arrive via a repeater) allows the network analysis system to collect data important to system operators. In the foregoing discussions the subject matter will be described in terms of a network analysis system, however as noted above, any network receiver or sensor receiving a signal from the repeaters can employ the described method.

[0028] This disclosed subject matter allows repeater identification via the insertion of a low power, amplitude modulated RF signature based on a second signal. This co-channel signal is generated by applying a specific form of Amplitude Modulation (AM) to the entire repeater signal bandwidth and serves as a signature identifying that a mobile is being served through a particular repeater station, whose identity can be uniquely determined from the RF characteristics introduced by the repeater itself. The magnitude of the inband signal as well as any adjacent channel interference caused by the AM process can be controlled. When no signal is present in the repeater pass-band, the AM process generates a signature signal buried deep within the noise. When a signal is present, the signature signal can be used to uniquely identify the repeater.

[0029] In order to accomplish this, the following operations are performed within the repeater. The wideband signal $w(t)$ or primary signal constituting the signal to be repeated at the repeater is AM modulated using a narrowband signal of the form $(1 + r(t))$, where for purposes of this disclosure $r(t)$ is referred to as the second signal. The AM modulated signal is then subject to any pre-existing methodology of repetition used at that repeater, generally expressed as a delay on the signal followed by amplification.

[0030] The mathematical effect of this form of modulation is to generate a co-channel signal (e.g., the signature signal) $w(t)r(t)$ in the repeater bandwidth. The 1 in the term $(1 + r(t))$

simply replicates the primary signal (e.g., the mobile signal for uplink signals or the down link for base station signals). Since AM modulation is equivalent to multiplication, the modulation can also be viewed as multiplication of $w(t)$ by the function $(1+r(t))$.

[0031] To illustrate the concept further, consider a particular narrowband channel. In the narrowband channel, if an active mobile call using signal $s(t)$ was in progress, the co-channel signal generated by the AM process will be of the form $s(t)r(t)$. If the channel were inactive, the co-channel signal will be of the form $n(t)r(t)$ where $n(t)$ is noise. By suitably controlling the norm (or average amplitude) of $r(t)$, the magnitude of the co-channel component can be maintained at a much reduced power level with respect to the primary mobile signal $s(t)$. Further, any spectral spillage into adjacent bins can be reduced below the noise power level in those bins by suitably manipulating the amplitude of $r(t)$. Thus, the amplitude control of the signature signals allows the amplitude of the signature signal to lie buried in the naturally occurring noise that is present at the final destination receiver, i.e., the base station, the mobile appliance, or another network device.

[0032] By controlling the amplitude of the second signal $r(t)$, both the co-channel signal component and the adjacent channel interference can be made as large as or as small as desired. The amplitude control is determined based on the relative power desired between the primary signal $s(t)$ and the signature signal or co-channel component. After a proper determination is made, this amplitude is fixed at the repeater during operation. Generally the ratio of the primary signal and the secondary signal is greater than unity.

[0033] Thus, for example in an active cellular channel, the introduced repeater identification signal, the signature signal can be at a power level 9dB or lower than the primary signal; whereas, in an inactive channel, the signature signal will be 9dB or lower than the preexisting noise in that channel. In every channel, the corresponding signature signal is preferably at a power level 9dB or lower than the pre-existing signal level in that channel. The 9dB value is chosen simply to quantify the concept and any other number can be selected with equal applicability. For a given primary signal $s(t)$, it is apparent that the second signal $r(t)$ distinguishes the particular repeater. Thus each repeater has a unique second signal $r(t)$, which is a narrowband waveform.

[0034] The collection of such second signals $r(t)$ over a set of repeaters, denoted S , may be drawn from sets of waveforms with specific properties. For example, the set S may be orthogonal, quasi-orthogonal, or shift-orthogonal. The properties of the second signals $r(t)$ used to generate the set S will, among other things, depend on the number of repeaters implemented in a cellular system cell or sector. Code sequences such as Golay-Hadamard and other sequences are equally envisioned when appropriate.

[0035] An aspect of the disclosed subject matter that needs to be highlighted is that the signature signal $s(t)r(t)$ is formed as a function of the primary signal and the second signal. The signature signal is not the second signal. The signature signal differs from other signature signals based not only on the particular repeater but also on the primary signal that is input to the repeater. As shown in Figure 7, the repeater 702 receives a primary signal from the mobile appliance 701 or other network transmitter. The primary signal $s(t)$ is then multiplied by a function $(1+r(t))$ where $r(t)$ is a second signal unique to the repeater. The output of the repeater is an aggregate signal $s(t)(1+r(t))$ including both the primary signal $s(t)$ and the signature signal $s(t)r(t)$. The network analysis system 703 then receives and processes the aggregate signal as described later to determine if the signal was received via a repeater and, if so, determines the specific repeater.

[0036] Figure 8 is a representation of an embodiment of a modification circuit used to create the aggregate signal from the primary signal. In the repeater 800, the receiver 801 receives and supplies the primary signal $s(t)$ to an A/D converter 802 and the digital signal is supplied to the modification circuit 810. The modification circuit includes a cyclic shift register 813, a signal multiplier 811 and a signal adder 812. As illustrated, the cyclic shift register 813 and the primary signal are inputs to the signal multiplier 811. The primary signal and the output of the signal multiplier 813 are connected to the inputs of the signal adder 812 and the output of the signal adder is connected to the D/A converter 803 which provides the analog aggregate signal to a transmitter 804. The cyclic shift register 813 provides a repeating sequence $r_k(t)$. The modification circuit could likewise be entirely analog or other combinations of analog and digital. The modification circuit shown is for illustrative purposes only and is not meant to limit the scope of the present subject matter.

[0037] The repeaters may either apply their identifying signals or signature signals, synchronously or asynchronously. A synchronous approach would require the repeaters to operate in unison with an extraneous clock but would provide greater discrimination of the repeater at the location sensor. The repeaters may also apply identifying signals in a repetitive loop so that the waveforms $r(t)$ repeatedly cycle.

[0038] Figure 4 is a representative flow chart describing an embodiment of a repeater watermarking a primary signal. In the method 400, the repeater receives a primary signal $s(t)$ as shown in Block 401. The primary signal, as indicated earlier, can come from a mobile appliance as an uplink signal, a base station as a downlink signal, or from another network device such as another repeater. The repeater then creates a signature signal as a function of the primary signal and a second signal which is associated with the repeater. In the embodiment shown in Figure 4, the primary signal $s(t)$ is multiplied by the second signal $r(t)$ to obtain the signature signal $s(t)r(t)$ as shown in Block 403. The repeater then transmits the primary signal $s(t)$, or a copy thereof, along with the amplitude controlled signature signal $s(t)r(t)$ as an aggregate signal $s(t)(1+r(t))$ as shown in Block 405. The second signal $r(t)$ may be a code sequence.

[0039] The detection of the signature signal at the network sensor or receiver is formed from two hypotheses. The signal in a narrowband channel at the location sensor is either of the two hypotheses. Hypothesis 1: where the received signal is the primary signal $s(t)$ plus noise; or Hypothesis 2: where the received signal is $s(t)(1+r(t))$ plus noise.

[0040] The network sensor or receiver determines which hypothesis is true and if Hypothesis 2 is true, identifies which $r(t)$ in S is applicable thereby identifying the repeater used.

[0041] Since it is generally very difficult to search for the signature signal without first extracting the primary signal from the aggregate signal received, the signal recovery proceeds in two stages. An embodiment of a method for signal recovery is shown in Figure 5. The first stage is the detection of the primary signal, and the second stage is the computation of candidate signature signals or candidate aggregate signals based on the derived primary signal and all possible candidate second signals of repeaters from which the aggregate signal could be received from, i.e., all of the repeaters in the set S or a subset of S within a predetermined propagation distance from the sensor.

[0042] A receiver receiving a signal (e.g., a mobile uplink signal) proceeds in the following manner to determine whether the call was amplified by a repeater, and the identity of the repeater as shown in Figure 5.

[0043] The receiver receives a signal, which may or may not be an aggregate signal, as shown in Block 502. The signal received by the receiver may come directly from a mobile or other system node in which case the signal is not an aggregate signal. If the signal is received via a repeater then it is an aggregate signal. The network analysis system extracts the primary signal as shown in Block 504, for example, by determining the signal waveform $s(t)$ by methods known to those of skill in the art. Since the signature signal (if the signature signal exists) is below the noise level in the channel, this detection proceeds as well as it would in the absence of the AM process. That is, the introduction of the signature signal $s(t)r(t)$ does not compromise the detection of the primary mobile signal $s(t)$ in any significant manner. The extracted primary signal is processed to recover the data or voice information in Block 505.

[0044] The system may then null out the primary signal $s(t)$ from the aggregate signal $s(t)(1+r(t))$ plus noise as shown in Block 506. Depending on the nulling technique used, the purity of extracting the residual signal $s(t)r(t)$ will differ. In general, the result of the nulling process will be to generate a noisy version of the signal $s(t)r(t)$. An additional source of perturbation on the signal $s(t)r(t)$ will result if the channel is filtered. However, this step of nulling out the primary signal is not necessary for some embodiments of the present subject matter.

[0045] Having determined the primary signal $s(t)$, it is possible to formulate the candidate signature signals $s(t)r(t)$ as shown in Block 508. The present disclosure also envisions, for embodiments that do not null out the primary signal, formulating candidate aggregate signals $s(t)(1+r(t))$. The possible second signals $r(t)$ associated with repeaters in operational range of the receiver can be acquired and stored in a number of ways known to those of skill in the art. The problem then reduces to detection of the known signature signal $s(t)r(t)$ (possibly filtered) in the aggregate signal $s(t)(1+r(t))$ plus noise (if not nulled) or detection of the known signature signal $s(t)r(t)$ (possibly filtered) in the nulled aggregate signal $s(t)r(t)$ plus noise as shown in Block 510 where the primary signal is nulled. Detection of a known signal in noise is a problem that has been solved by numerous known methods and all applicable prior art methods are envisioned. If

the candidate signature signal $s(t)r(t)$ is not detected or the candidate aggregate signal $s(t)(1+r(t))$ is not detected, Hypothesis 1 holds, thus eliminating the possibility that the mobile signal was operated on (e.g., amplified) by a repeater. If the signal $s(t)r(t)$ is detected, Hypothesis 2 holds, and the particular $r(t)$ that effected the detection then unambiguously identifies the repeater.

[0046] Figure 6 is a representative flow chart for a method 600 for determining if an uplink signal was received via a repeater according to an embodiment of the present subject matter. At the repeater 620 a primary signal is received from a mobile operating in the service area of the repeater 620 as shown in Block 601. The primary signal is then multiplied by a second signal, for this embodiment, sequence associated with the particular repeater 620 as shown in Block 602. The primary signal and the signature signal which is a function of the primary signal and the sequence is transmitted as an aggregate signal to the base stations and wireless location sensors within range of the repeater as shown in Block 603.

[0047] The waveform of the primary signal $s(t)$ (e.g., uplink signal) is determined using known prior art methods as shown in Block 606. From the signal waveform of the primary signal $s(t)$, candidate signals, either a candidate signature signal $s(t)r(t)'$ or a candidate aggregate signal $s(t)(1+r(t))'$ is calculated using the known second signals $r(t)$. The network analysis or geolocation system then uses prior art methods to detect the candidate signature signals or candidate aggregate signals in the uplink signal as shown in Block 608. If a candidate signal is found, then the uplink signal is received via a repeater and the specific repeater can be determined by the associated sequence as shown in Block 609.

[0048] Another embodiment envisioned by the current subject matter is implemented with a primary and secondary receiver. In this embodiment the primary receiver functions as normal to receive a first signal in a communication system whether or not the first signal is from a repeater or other network device and thus whether or not the first signal is an aggregate or composite signal. As described previously, the primary receiver extracts the primary signal $s(t)$ from the first signal $w(t)$. In addition to recovering the data from the primary signal, the primary signal is also provided to a secondary receiver.

[0049] The secondary receiver can be a separate receiver co-located at the primary receiver or contained within the primary receiver. In either case the methodology is generally

the same. The secondary receiver also receives the first signal. Since the secondary receiver has both the first signal $w(t)$ and the primary signal $s(t)$ provided by the primary receiver. An inverse transfer function can be applied such that the modification, if any, to the primary signal $s(t)$ will be revealed. The existence of the modification may be an indication that the signal was operated on by a repeater or other network device; and since each modification in the system is unique, the identity of the repeater or other network device can also be determined. A benefit of this latter embodiment is that the secondary receiver can be implemented as an add on, where the secondary receiver contains the hardware and software for determining the modification and is simply tapped into the existing primary receiver to recover the primary signal.

[0050] No constraint exists on combining the scheme of this subject matter with other schemes to identify a repeater. For example, in a GSM cellular protocol, a parameter termed the Timing Advance (TA) parameter may be used to identify the radius at which a particular mobile may be located. This TA parameter may be used jointly with the scheme proposed here to increase the number of identifiable repeaters in a cell or sector.

[0051] While preferred embodiments of the present inventive system and method have been described, it is to be understood that the embodiments described are illustrative only and that the scope of the embodiments of the present inventive system and method is to be defined solely by the appended claims when accorded a full range of equivalence, many variations and modifications naturally occurring to those of skill in the art from a perusal hereof.

What we claim is:

1. A wireless communication system comprising:

a plurality of base stations and at least one repeater,

the at least one repeater comprises:

a receiver for receiving a primary signal;

a transmitter for transmitting a first signal;

a modification circuit for modifying the primary signal into the first signal, the modification circuit comprising: a cyclic shift register, a signal multiplier and a signal adder; the cyclic shift register and the receiver being connected to inputs of the signal multiplier, the receiver and output of the signal multiplier being connected to inputs of the signal adder; and, the output of the signal adder being connected to the transmitter.

2. The wireless communication system of Claim 1, further comprising an A/D converter between the receiver and the modifying circuit.

3. The wireless communication system of Claim 1, further comprising a D/A converter between the modifying circuit and the transmitter.

4. In a communication system including a primary receiver, a primary transmitter, and a repeater that applies a known modification to a primary signal passing there through that identifies the repeater, where the primary receiver receives a first signal from the primary transmitter either directly or via the repeater, and where the first signal includes a primary signal and, if the first signal is received from the repeater, also includes a secondary signal that is a function of the primary communication signal and the known modification applied by the repeater,

the method of determining if a signal received by the primary receiver is received directly from the primary transmitter or indirectly through the repeater, comprising the steps of:

receiving the first signal at the primary receiver;

outputting the primary signal from the primary receiver;

receiving the first signal at a secondary receiver and obtaining the primary signal from the primary receiver;

applying an inverse function of the first signal and the primary signal to retrieve a modification; and

determining whether the first signal has been received from the repeater by comparison of the modification and the known modification.

5. The method of Claim 4, wherein the communication system is a wireless communication system.

6. The method of Claim 4, wherein the primary receiver is a network analysis system.

7. The method of Claim 4, wherein the primary transmitter is a mobile unit.

8. The method of Claim 4, wherein the primary signal is a uplink signal.

9. The method of Claim 4, wherein the primary signal is a downlink signal.

10. The method of Claim 4, wherein the known modification is multiplication by a identification signal.

11. The method of Claim 10, wherein the identification signal is A.M.

12. The method of Claim 4, wherein the primary signal is amplified such that the ratio of the primary signal to the secondary signal is greater than unity.

13. The method of Claim 12, wherein the secondary signal is 9dB less than the primary signal.

14. The method of Claim 4, wherein the primary transmitter is a mobile unit
15. The method of Claim 4, wherein the secondary receiver is a network analysis system.
16. The method of Claim 4, comprising the step of nulling the primary signal.
17. In a communication system including a first node, a second node, and a repeater, wherein the first node receives a first signal from the second node either directly or via the repeater, a method of applying a known distortion to a signal to enable a determination of a signal received by the first node is received directly from the second node or indirectly through the repeater, comprising the steps of:
- at the repeater receiving a primary signal and creating a secondary signal as a function of the primary signal and a known modification, wherein the known modification identifies the repeater; and
- transmitting the primary signal injected with the secondary signal as the first signal to the primary receiver.
18. The method of Claim 17, wherein the communication system is a wireless communication system.
19. The method of Claim 17, wherein the primary receiver is a network analysis system.
20. The method of Claim 17, wherein the second node is a mobile unit.
21. The method of Claim 17, wherein the secondary signal is transmitted 9db or less than the primary signal.
22. the method of Claim 17, wherein the known modification is multiplication by a identification signal.

23. The method of Claim 22, wherein the identification signal is AM.

24. In a wireless communication system having one or more repeaters, a first node and a second node, a method of determining if a signal received at the first node is received directly or via one of the one or more repeaters comprising;

creating, at the one or more repeaters, a composite signal $w(t)$ that is a function $f(r(t), s(t))$ of a primary signal $s(t)$ received from the second node and a known identification signal $r_k(t)$, where $r_k(t)$ is unique for each of the one or more repeaters;

transmitting the composite signal to the first node;

detecting at the first node the primary signal $s(t)$;

determining an identification signal $r(t)$ from an inverse function $g(w(t), s(t))$ of the composite signal $w(t)$ and the primary signal $s(t)$, where g is the inverse of f ; and

determining if the signal is received via the one or more repeaters based at least in part by the identification signal and the known identification signals of the one or more repeaters.

25. The method of Claim 24, wherein the known identification signal is AM modulated.

26. The method of Claim 24, wherein the function $f(r(t), s(t))$ is $s(t)(1 + r_k(t))$

27. The method of Claim 24, wherein the inverse function $g(w(t), s(t))$

is $s^{-1}(t)(w(t) - s(t))$.

28. The method of Claim 24, wherein the one or more repeaters are synchronized.

29. The method of Claim 24, wherein the one or more repeaters are not synchronized.

30. The method of Claim 24, wherein the plurality of repeaters are synchronized.

31. The method of Claim 24 wherein the first node is a network analysis system.

32. The method of Claim 24 wherein the second node is a mobile unit.

33. The method of Claim 24, wherein the primary signal is a uplink signal.
34. The method of Claim 24, wherein the first node is a mobile unit
35. The method of Claim 24, wherein the second node is a network analysis system.

ABSTRACT

A system and method of applying a known modification to a signal to enable a determination of a signal received by a first node is received directly from a second node or indirectly through a repeater. The repeater receives a primary signal and creates a secondary signal as a function of the primary signal and a known modification, wherein the known modification identifies the repeater. The primary signal is transmitted and injected with the secondary signal as the first signal to the primary receiver.

Atty Docket: GRA26 029US

Today's Date: 20 September 2006

In re of Application of Martin ALLES et al.
Application Serial No.: 10/586,744
Filing Date: 21 July 2006

Art Unit No.: Unassigned
Examiner: Unassigned

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON THE
PATH OF A COMMUNICATION SIGNAL USING (1+R(T)) AMPLITUDE
MODULATION

The following has been received in the U.S. Patent & Trademark Office on the date stamped
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X	Transmittal (in duplicate)
X	Information Disclosure Statement

Due Date: None

Duane Morris LLP
1667 K Street, N.W.
Suite 700
Washington, D.C. 20006
202.776.7800

Atty Docket: GRA26 029US

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Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

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☐ Filed after first Office Action.

The Commissioner is hereby authorized to charge payment of any additional fees
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04-1679.

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Respectfully submitted,

Mark C. Comtois

Reg. No. 46,285

DUANE MORRIS LLP
1667 K Street, N.W., Suite 700
Washington, D.C. 20006
Telephone: (202) 776-7800
Facsimile: (202) 776-7801

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Application Number	10/586,744
Filing Date	July 21, 2006
First Named Inventor	Martin ALLES
Art Unit	Unassigned
Examiner Name	Unassigned
Attorney Docket Number	GRA26 029US

[illegible][illegible]Date
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In re the Patent Application of Martin Alles, *et al.*

Serial No.: 10/586,744

Art Unit: Unassigned

Filed: 21 July 2006

Examiner: Unassigned

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR
DEVICES ON THE PATH OF A COMMUNICATION SIGNAL
USING (1+RT)) AMPLITUDE MODULATION

Papers Enclosed: Two Transmittal Forms and a Status Inquiry for the above-
identified application.

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In re the Patent Application of Martin Alles, *et al.*

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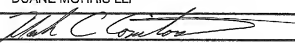
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First Named Inventor	Martin Alles
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Examiner Name	Unassigned
Attorney Docket Number	GRA26 029 US

ENCLOSURES (Check all that apply)

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	DUANE MORRIS LLP		
Signature			
Printed name	Mark C. Comtols		
Date	August 28, 2007	Reg. No.	46,265

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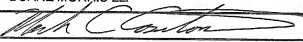
Total Number of Pages in This Submission

Application Number	10/586,744
Filing Date	21 July 2006
First Named Inventor	Martin Allies
Art Unit	Unassigned
Examiner Name	Unassigned
Attorney Docket Number	GRA26 029 US

ENCLOSURES (Check all that apply)

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Printed name	Mark C. Comtols		
Date	August 28, 2007	Reg. No.	46,285

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Patent Application of Martin Alles, *et al.*

Serial No.: 10/586,744

Art Unit: Unassigned

Filed: 21 July 2006

Examiner: Unassigned

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES
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AMPLITUDE MODULATION

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Commissioner for Patents
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Sir:

Applicant respectfully inquires as to the status of the above-referenced application.

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The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 04-1679.

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Respectfully submitted,



Mark C. Comtois

Reg. No. 46,285

DUANE MORRIS LLP
1667 K Street, N.W., Suite 700
Washington, D.C. 20006
Telephone: (202) 776-7800
Facsimile: (202) 776-7801

Dated: August 28, 2007



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PATENT ASSIGNMENT

Electronic Version v1.1

Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT												
NATURE OF CONVEYANCE:	ASSIGNMENT												
CONVEYING PARTY DATA													
<table border="1"><thead><tr><th>Name</th><th>Execution Date</th></tr></thead><tbody><tr><td>Martin ALLES</td><td>11/12/2007</td></tr><tr><td>Joseph P. KENNEDY, JR.</td><td>11/09/2007</td></tr><tr><td>John Peter CARLSON</td><td>11/06/2007</td></tr></tbody></table>	Name	Execution Date	Martin ALLES	11/12/2007	Joseph P. KENNEDY, JR.	11/09/2007	John Peter CARLSON	11/06/2007					
Name	Execution Date												
Martin ALLES	11/12/2007												
Joseph P. KENNEDY, JR.	11/09/2007												
John Peter CARLSON	11/06/2007												
RECEIVING PARTY DATA													
<table border="1"><tr><td>Name:</td><td>Andrew Corporation</td></tr><tr><td>Street Address:</td><td>3 Westbrook Corporate Center</td></tr><tr><td>Internal Address:</td><td>Suite 900</td></tr><tr><td>City:</td><td>Westchester</td></tr><tr><td>State/Country:</td><td>ILLINOIS</td></tr><tr><td>Postal Code:</td><td>60154</td></tr></table>	Name:	Andrew Corporation	Street Address:	3 Westbrook Corporate Center	Internal Address:	Suite 900	City:	Westchester	State/Country:	ILLINOIS	Postal Code:	60154	
Name:	Andrew Corporation												
Street Address:	3 Westbrook Corporate Center												
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Postal Code:	60154												
PROPERTY NUMBERS Total: 1													
<table border="1"><thead><tr><th>Property Type</th><th>Number</th></tr></thead><tbody><tr><td>Application Number:</td><td>10586744</td></tr></tbody></table>	Property Type	Number	Application Number:	10586744									
Property Type	Number												
Application Number:	10586744												
CORRESPONDENCE DATA													
Fax Number: (202)776-7801													
Correspondence will be sent via US Mail when the fax attempt is unsuccessful.													
Phone: 2027767800													
Email: cityson@daaemorris.com													
Correspondent Name: Duane Morris LLP													
Address Line 1: 1667 K Street N.W.													
Address Line 2: Suite 700													

Address Line 4: Washington, DISTRICT OF COLUMBIA 20006	
ATTORNEY DOCKET NUMBER:	GRA26 029
NAME OF SUBMITTER:	Mark Charles Comtois
Signature:	/mcc/
Date:	11/16/2007
Total Attachments: 3 source=q.Executed.Assignment.GRA26 029#page1.tif source=q.Executed.Assignment.GRA26 029#page2.tif source=q.Executed.Assignment.GRA26 029#page3.tif	
RECEIPT INFORMATION EPAS ID: PAT411268 Receipt Date: 11/16/2007 Fee Amount: \$40	

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Tyson, Christopher J.

From: EPAS Server [epas-server@uspto.gov]
Sent: Friday, November 16, 2007 1:29 PM
To: Tyson, Christopher J.
Subject: Assignment confirmation receipt ID: PAT411268

Attachments: EASPAT411268.html



EASPAT411268.htm
1 (5 KB)

ELECTRONIC PATENT ASSIGNMENT SYSTEM (EPAS) CONFIRMATION RECEIPT

The USPTO has received a Patent Assignment submitted through the Electronic Patent Assignment System (EPAS). This is the only acknowledgement of receipt that will be transmitted for this EPAS submission. The submission may not be recalled.

After review by Assignment Services Division personnel a Notice of Recordation/Non-Recordation will be returned via fax. USPTO will attempt to fax to the number provided in the submission; fax failures will be delivered via US Postal Service to the Correspondence Address provided in the submission.

If a communication from the Assignment Services Division has not been received within 60 days of your confirmation receipt contact the Assignment Services Division Customer Service Desk at 571-272-3350 or send an e-mail to epas@uspto.gov.

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A printable version of the Confirmation Receipt is attached to this e-mail.

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PATENT ASSIGNMENT

Electronic Version v1.1

Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
Martin ALLES	11/12/2007
Joseph P. KENNEDY, JR.	11/09/2007
John Peter CARLSON	11/06/2007
RECEIVING PARTY DATA	
Name:	Andrew Corporation
Street Address:	3 Westbrook Corporate Center
Internal Address:	Suite 900
City:	Westchester
State/Country:	ILLINOIS
Postal Code:	60154
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	10586744
CORRESPONDENCE DATA	
Fax Number:	(202)776-7801
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>	
Phone:	2027767800
Email:	cjtyson@duanemorris.com
Correspondent Name:	Duane Morris LLP
Address Line 1:	1667 K Street N.W.
Address Line 2:	Suite 700
Address Line 4:	Washington, DISTRICT OF COLUMBIA 20006
ATTORNEY DOCKET NUMBER:	GRA26 029
NAME OF SUBMITTER:	Mark Charles Comtois

Signature:	/mcc/
Date:	11/16/2007
Total Attachments: 3 source=q.Executed.Assignment.GRA26 029#page1.tif source=q.Executed.Assignment.GRA26 029#page2.tif source=q.Executed.Assignment.GRA26 029#page3.tif	
RECEIPT INFORMATION	
EPAS ID:	PAT411268
Receipt Date:	11/16/2007
Fee Amount:	\$40

ASSIGNMENT

Insert Name(s) of Inventor(s) Martin ALLES
Joseph P. KENNEDY, JR.
John Peter CARLSON

In consideration for good and valuable considerations, the receipt of which is acknowledged by each of the undersigned, the undersigned agree(s) to assign, and hereby do(es) assign, transfer and set over to

Insert name of Assignee Andrew Corporation
Insert address of Assignee 3 Westbrook Corporate Center
 Suite 900
 Westchester, IL 60154

and its successors, legal representatives and assigns (hereinafter designated as the Assignee) the entire right, title and interest in the invention disclosed and/or claimed in the United States application identified below, as well as all applications for patent and any Letters Patent which may be granted therefore in the United States of America and all foreign countries, and in and to any and all divisions, continuations, continuations-in-part of said applications, or re-issues or extensions of said patents or Letters Patent, and all rights under the International Convention for the Protection of Industrial Property:

Insert Identification of SYSTEM AND METHOD FOR IDENTIFYING THE PATH
 OR DEVICES ON THE PATH OF A COMMUNICATION
 SIGNAL USING (1+ π (T)) AMPLITUDE MODULATION

Docket Number, or Foreign Docket No. GRA26 029
Application Number

Insert date of signing of _____
application

Alternative identification Application Number: 10/586,744
for filed applications Filed: July 21, 2006

The undersigned further agree(s) to cooperate with the Assignee in every way possible and to do all

affirmative acts, and to execute all papers which counsel for Assignee shall advise are necessary and/or desirable without charge to Assignee in connection with said applications including, without limitation, the execution of separate assignments in connection with such applications, claims or provisions of the International Convention for Protection of Industrial Property or similar agreements.

The undersigned hereby authorize(s) and request(s) the Commissioner of Patents to issue any and all Letters Patent of the United States resulting from said application or any division or divisions or continuing applications thereof to said Assignee, as Assignee of the entire interest, and hereby covenants that he/she has (they have) full right to convey the entire interest herein assigned, and that he/she has (they have) not executed and will not execute, any agreement in conflict herewith.

The undersigned hereby grant(s) to Mark C. Comtois, Reg. No. 46,285; D. Joseph English, Reg. No. 42,514; and Patrick D. McPherson, Reg. No. 46,255 the power to insert on this assignment any further identification which may be necessary or desirable in order to comply with the rules of the United States Patent Office for recordation of this document.

In witness whereof, executed by the undersigned on the date(s) opposite the undersigned name(s).

Date 11/12/07

Signature of Inventor Martin C. Alles
MARTIN ALLES

Date _____

Signature of Inventor _____
JOSEPH P. KENNEDY, JR.

Date 11/6/07

Signature of Inventor John Peter Carlson
JOHN PETER CARLSON

affirmative acts, and to execute all papers which counsel for Assignee shall advise are necessary and/or desirable without charge to Assignee in connection with said applications including, without limitation, the execution of separate assignments in connection with such applications, claims or provisions of the International Convention for Protection of Industrial Property or similar agreements.

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In witness whereof, executed by the undersigned on the date(s) opposite the undersigned name(s).

Date _____

Signature of Inventor

MARTIN ALLES

Date 11/09/2007

Signature of Inventor

JOSEPH P. KENNEDY, JR.

Date _____

Signature of Inventor

JOHN PETER CARLSON

J:DUANE MORRIS LLP COMPANY 1667 K STREET N.W.



UNITED STATES PATENT AND TRADEMARK OFFICE

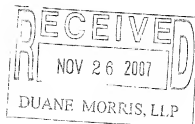
UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

GRA26 029 US

NOVEMBER 16, 2007

PTAS

500400469

DUANE MORRIS LLP
1667 K STREET N.W.
SUITE 700
WASHINGTON, DC 20006UNITED STATES PATENT AND TRADEMARK OFFICE
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 571-272-3350. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT SERVICES BRANCH, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 11/16/2007

REEL/FRAME: 020122/0643
NUMBER OF PAGES: 5BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).
DOCKET NUMBER: GRA26 029

ASSIGNOR:

ALLES, MARTIN

DOC DATE: 11/12/2007

ASSIGNOR:

KENNEDY, JOSEPH P., JR.

DOC DATE: 11/09/2007

ASSIGNOR:

CARLSON, JOHN PETER

DOC DATE: 11/06/2007

ASSIGNEE:

ANDREW CORPORATION
3 WESTBROOK CORPORATE CENTER
SUITE 900
WESTCHESTER, ILLINOIS 60154

DOCKETED

D:DUANE MORRIS LLP COMPANY .667 K STREET N.W.

020122/0643 PAGE 2

SERIAL NUMBER: 10586744

FILING DATE:

PATENT NUMBER:

ISSUE DATE:

TITLE: SYSTEM & METHOD FOR IDENTIFYING THE PATH OR DEVICE ON THE PATH OF A
COMMUNICATION SIGNAL USING (1+R(T))AMPLITUDE MODULATION

ASSIGNMENT SERVICES BRANCH
PUBLIC RECORDS DIVISION

PATENT ASSIGNMENT

Electronic Version v1.1
Stylesheet Version v1.1

11/16/2007
500400469

SUBMISSION TYPE:

NEW ASSIGNMENT

NATURE OF CONVEYANCE:

ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
Martin ALLES	
Joseph P. KENNEDY JR.	11/12/2007
John Peter CARLSON	11/09/2007
	11/08/2007

RECEIVING PARTY DATA

Name:	Andrew Corporation
Street Address:	3 Westbrook Corporate Center
Internal Address:	Suite 900
City:	Westchester
State/Country:	ILLINOIS
Postal Code:	60154

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	10586744

CORRESPONDENCE DATA

Fax Number: (202)776-7801

Correspondence will be sent via US Mail when the fax attempt is unsuccessful.

Phone: 2027767800

Email: clyson@duanemorris.com

Correspondent Name: Duane Morris LLP

Address Line 1: 1667 K Street N.W.

Address Line 2: Suite 700

Address Line 4: Washington, DISTRICT OF COLUMBIA 20006

ATTORNEY DOCKET NUMBER:

GRA26 029

NAME OF SUBMITTER:

CH \$40.00 10586744

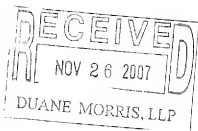
D:DUANE MORRIS LLP COMPAN: 667 K STREET N.W.

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O:DUANE MORRIS LLP COMPAN: 367 K STREET N.W.

**UNITED STATES PATENT AND
TRADEMARK OFFICE****Facsimile Transmission****To:****Name:**

DUANE MORRIS LLP

Company:

1667 K STREET N.W.

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Voice Phone:**From:****Name:**

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Voice Phone:

571-272-3350

37 C.F.R. 1.6 sets forth the types of correspondence that can be communicated to the Patent and Trademark Office via facsimile transmissions. Applicants are advised to use the certificate of facsimile transmission procedures when submitting a reply to a non-final or final Office action by facsimile (37 CFR 1.8(a)).

Fax Notes:

Pg#	Description
1	Cover Page
2	510.TXT
4	Document 1, Batch 1094781

USPTO ASSIGNMENT SYSTEM PROCESSING

Date and time of transmission: Wednesday, November 21, 2007 4:35:32 PM

Number of pages including this cover sheet: 05

Acknowledgement Receipt

The USPTO has received your submission at **14:32:49** Eastern Time on **10-MAR-2008**.

No fees have been paid for this submission. Please remember to pay any required fees on time to prevent abandonment of your application.

eFiled Application Information

EFS ID	2972272
Application Number	10586744
Confirmation Number	6007
Title	System & method for identifying the path or device on the path of a communication signal using (1+r(t))amplitude modulation
First Named Inventor	Joseph P. Martin Alles
Customer Number or Correspondence Address	39290
Filed By	Mark Charles Comtois/Jacquetta McBee
Attorney Docket Number	GRA26 029US
Filing Date	
Receipt Date	10-MAR-2008
Application Type	U.S. National Stage under 35 USC 371

Application Details

Submitted Files	Page Count	Document Description	File Size	Warnings
GRA26_029US_StatusInquiry_SupplementalADS.pdf	4		253910 bytes	◆ PASS
		Document Description	Page	Start Page End
		Request for status of Application	1	2
		Application Data Sheet	3	4

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

If you need help:

- *Call the Patent Electronic Business Center at (866) 217-9197 (toll free) or e-mail EBC@uspto.gov for specific questions about Patent e-Filing.*
- *Send general questions about USPTO programs to the USPTO Contact Center (UCC).*
- *If you experience technical difficulties or problems with this application, please report them via e-mail to [Electronic Business Support](#) or call 1 800-786-9199.*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Patent Application of Martin Alles, *et al.*

Confirmation No.: 6007

Serial No.: 10/586,744

Art Unit: Unassigned

Filed: 21 July 2006

Examiner: Unassigned

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES
ON THE PATH OF A COMMUNICATION SIGNAL USING (1+RT))
AMPLITUDE MODULATION

SECOND STATUS INQUIRY

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

Applicant respectfully inquires as to the status of the above-referenced application. The application was filed on 21 July 2006, and its last known status was receipt of the Notice of Recordation of Assignment Document mailed on November 16, 2007. To date, no further communication has been received on this application.

The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 04-1679.

If a Petition for an Extension of Time is necessary for the paper transmitted herewith to be timely filed, this transmittal is to be considered as a petition to extend the response period by the amount of time needed for the paper to be timely filed.

Respectfully submitted,

/mcc/

Mark C. Comtois

Reg. No. 46,285

DUANE MORRIS LLP
505 9th Street, N.W., Suite 1000
Washington, D.C. 20004
Telephone: (202) 776-7800
Facsimile: (202) 776-7801

Dated: March 10, 2008

1279

ATTORNEY DOCKET NO.: GRA26 029US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Patent Application of: Martin ALLES, et al.

Serial No.: NEW NATIONAL STAGE APPLICATION
of PCT/US2005/016748

Art Unit: Unassigned

Filed: HEREWITH

Examiner: Unassigned

Title: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON
THE PATH OF A COMMUNICATION SIGNAL USING (1+ π (T)) AMPLITUDE
MODULATION

SUBSTITUTE APPLICATION DATA SHEET

BOX PATENT APPLICATION

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Sir:

INVENTOR(S): ALLES, MARTIN
2421 Williams Avenue 16 STONEHAVEN ROAD
VIENNA, VIRGINIA 20175 HAMILTON PARISH
FLO4
BERMUDA

NATIONALITY: US

KENNEDY, JR., JOSEPH P.
11127 ELMVIEW PLACE
GREAT FALLS, VA 22066

NATIONALITY: US

INVENTOR(S): Cont'd.


CARLSON, JOHN PETER
43479 OGDEN PLACE
DULLES, VIRGINIA 20166

NATIONALITY: US

PRIORITY:

United States Provisional Application Serial No. 60/570,082, 60.570,081
and 60/570,067
Filed: 12 May 2004

Please address all correspondence and direct all inquiries to:



Mark C. Comtois
DUANE MORRIS LLP
1667 K Street, N.W., Suite 700
Washington, DC 20006
Telephone: (202) 776-7800
Telecopier: (202) 776-7801

Customer No.: 39,290

Respectfully submitted,

/mcc/

Mark C. Comtois	Reg. No. 46,285
D. Joseph English	Reg. No. 42,514
Patrick D. McPherson	Reg. No. 46,255

DUANE MORRIS LLP
505 9th Street, N.W., Suite 1000
Washington, DC 20006
Telephone: (202) 776-7800
Telecopier: (202) 776-7801
Dated: March 10, 2008



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

U.S. APPLICATION NUMBER NO. 10/586,744	FIRST NAMED APPLICANT Martin Alles	ATTY. DOCKET NO. GRA26 029US
---	---------------------------------------	---------------------------------

39290
DUANE MORRIS LLP
505 9th Street
Suite 1000
WASHINGTON, DC 20004-2166

INTERNATIONAL APPLICATION NO. PCT/US2005/016748	
LA. FILING DATE 05/11/2005	PRIORITY DATE 05/12/2004

RECEIVED
DUANE MORRIS, LLP

JUN 13 2008

CONFIRMATION NO. 6007
371 FORMALITIES LETTER



Date Mailed: 06/11/2008

**NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371
IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)**

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- Priority Document
- Copy of the International Application filed on 07/21/2006
- Copy of the International Search Report filed on 07/21/2006
- Copy of IPE Report filed on 07/21/2006
- Information Disclosure Statements filed on 09/20/2006
- U.S. Basic National Fees filed on 07/21/2006
- Priority Documents filed on 07/21/2006
- Specification filed on 07/21/2006
- Claims filed on 07/21/2006
- Abstracts filed on 07/21/2006
- Drawings filed on 07/21/2006

8.11.08
DOCKETED

The applicant needs to satisfy supplemental fees problems indicated below.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the international application number and international filing date.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.492(h) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fees required for this application is **\$130** for a Large Entity:

- \$130 Surcharge.

ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION, WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.

<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebsc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

VONDA M WALLACE

Telephone: (703) 308-9140 EXT 225

Acknowledgement Receipt

The USPTO has received your submission at **12:55:48** Eastern Time on **23-JUN-2008**.

No fees have been paid for this submission. Please remember to pay any required fees on time to prevent abandonment of your application.

eFiled Application Information

EFS ID	3499388
Application Number	10586744
Confirmation Number	6007
Title	System & method for identifying the path or device on the path of a communication signal using (1+r(t))amplitude modulation
First Named Inventor	Martin Alles
Customer Number or Correspondence Address	79172
Filed By	Mark Charles Comtois/Jacquetta McBee
Attorney Docket Number	GRA26 029US
Filing Date	
Receipt Date	23-JUN-2008
Application Type	U.S. National Stage under 35 USC 371

DOCKETED

Application Details

Submitted Files	Page Count	Document Description	File Size	Warnings
GRA26_029US_COMBINEDDECLARATION.pdf	2	Oath or Declaration filed	172644 bytes	◆ PASS

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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- *Call the Patent Electronic Business Center at (866) 217-9197 (toll free) or e-mail EBC@uspto.gov for specific questions about Patent e-Filing.*
- *Send general questions about USPTO programs to the [USPTO Contact Center \(UCC\)](#).*
- *If you experience technical difficulties or problems with this application, please report them via e-mail to [Electronic Business Support](#) or call 1 800-786-9199.*

COMBINED DECLARATION AND POWER OF ATTORNEY FOR UTILITY PATENT APPLICATION

As a below named inventor, I hereby declare:

that my residence, post office address and citizenship are as stated below next to my name;
that I verily believe that I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention which is the subject of an application entitled: SYSTEM AND METHOD FOR IDENTIFYING THE PATH OR DEVICES ON THE PATH OF A COMMUNICATION SIGNAL USING (1 & R(T)) AMPLITUDE MODULATION; said invention being described and claimed [] in the attached specification [X] in the specification of application Serial No. 10/586,744, filed July 21, 2006; that I have reviewed and understand the content of said specification including the claims; that I do not know and do not believe the said invention was ever known or used in the United States before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to said application; that said invention was not in public use or on sale in the United States more than one year prior to said application; that said invention has not been patented or made the subject of an inventor's certificate issued before the date of said application in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months prior to said application; that I acknowledge my duty to disclose information of which I am aware which is material to patentability as defined in 37 CFR 1.56; and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States prior to said application by me or my legal representatives or assigns, except as follows:

COUNTRY/INTERNATIONAL	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. 119/36
			YES <input type="checkbox"/> NO <input type="checkbox"/>
			YES <input type="checkbox"/> NO <input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. '119(e) of any United States provisional application listed below:

U.S. Provisional Application S.N. 60/570,082 filed May 12, 2004
60/570,081 filed May 12, 2004; and
60/570,067 filed May 12, 2004.

I hereby appoint D. Joseph English, Reg. No. 42,514; Mark C. Comtois, Reg. No. 46,285; and Patrick D. McPherson, Reg. No. 46,285 to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith and to file, prosecute and transact all business in connection with international applications directed to said invention:

Address all correspondence to: Duane Morris LLP
505 9th Street, N.W., Suite 1000
Washington, DC 20004-2166

Direct all telephone calls to (202) 776-7800

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Martin Alles
FULL NAME OF FIFTH JOINT INVENTOR, IF ANY

X Martin Alles 03/14/08
SIGNATURE DATE

2421 Williams Avenue, Vienna, VA 20175
RESIDENCE

OR
CITIZENSHIP

2421 Williams Avenue, Vienna, VA 20175
POST OFFICE ADDRESS

COMBINED DECLARATION AND POWER OF ATTORNEY FOR UTILITY PATENT APPLICATION

Joseph P. Kennedy, Jr. 2/11/08
FULL NAME OF SOLE OR FIRST INVENTOR SIGNATURE DATE
11127 Elmview Place, Great Falls, Virginia 22066
RESIDENCE USA
11127 Elmview Place, Great Falls, Virginia 22066
POST OFFICE ADDRESS CITIZENSHIP

John P. Carlson 3/13/08
FULL NAME OF FOURTH JOINT INVENTOR, IF ANY SIGNATURE DATE
43479 Ogden Place, Dulles, Virginia 20166
RESIDENCE USA
43479 Ogden Place, Dulles, Virginia 20166
POST OFFICE ADDRESS CITIZENSHIP



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
10/586,744	Martin Alles	GRA26 029US

79172
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

RECEIVED
DUANE MORRIS, LLP

JUL 07 2008

INTERNATIONAL APPLICATION NO.	
PCT/US2005/016748	
LA. FILING DATE	PRIORITY DATE
05/11/2005	05/12/2004

CONFIRMATION NO. 6007
371 ACCEPTANCE LETTER



000000030727815

Date Mailed: 07/02/2008

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is **ACCEPTED** for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

06/23/2008
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1),
(c)(2) and (c)(4) REQUIREMENTS

06/23/2008
DATE OF COMPLETION OF ALL
35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE " FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363). Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

- Copy of the International Application filed on 07/21/2006
- Copy of the International Search Report filed on 07/21/2006
- Copy of IPE Report filed on 07/21/2006
- Information Disclosure Statements filed on 09/20/2006
- Oath or Declaration filed on 06/23/2008
- U.S. Basic National Fees filed on 07/21/2006
- Priority Documents filed on 07/21/2006
- Specification filed on 07/21/2006
- Claims filed on 07/21/2006
- Abstracts filed on 07/21/2006
- Drawings filed on 07/21/2006

DOCKETED

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

ULYSSES G WALKER

Telephone: (703) 308-9290 EXT 130



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING or 371(c) DATE	GPART UNIT	FIL FEE REC'D	ATTY DOCKET NO	TOT CLAIMS	IND CLAIMS
10/586,744	06/23/2008	2618	1380	GRA26 029US	35	4

CONFIRMATION NO. 6007

FILING RECEIPT



0C000000030727814

79172

Duane Morris LLP

505 9th Street, N.W.

Suite 1000

Washington, DC 20004

RECEIVED
DUANE MORRIS, LLP

Date Mailed: 07/02/2008

JUL 9 7 2008

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon.** If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections

Applicant(s)

Martin Alles, Vienna, VA;
Joseph P. Kennedy JR., Great Falls, VA;
John P. Carlson, Dulles, VA;

Assignment For Published Patent Application

ANDREW CORPORATION, Ashburn, VA

Power of Attorney: The patent practitioners associated with Customer Number 79172

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US2005/016748 05/11/2005
which claims benefit of 60/570,081 05/12/2004
and claims benefit of 60/570,082 05/12/2004
and claims benefit of 60/570,067 05/12/2004

Foreign Applications

If Required, Foreign Filing License Granted: 06/29/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 10/586,744**

Projected Publication Date: 10/09/2008

Non-Publication Request: No

Early Publication Request: No

DOCKETED

Title

System and Method for Identifying the Path or Devices on the Path of a Communication Signal Using (1+r(T)) Amplitude Modulation

Preliminary Class

455

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process simplifies the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where

the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/586,744	06/23/2008	Martin Alles	GRA26 029US

CONFIRMATION NO. 6007

PUBLICATION NOTICE



00000000032521516

79172
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

Title: System and Method for Identifying the Path or Devices on the Path of a Communication Signal Using (1+r(T)) Amplitude Modulation

Publication No. US-2008-0248745-A1

Publication Date: 10/09/2008

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



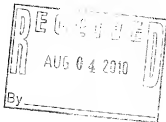
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Case Abandoned

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,744	06/23/2008	Martin Alles	GRA26 029US	6007

79172 7590 08/02/2010
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004



EXAMINER

LEE, JOHN J

ART UNIT	PAPER NUMBER
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2618

MAIL DATE	DELIVERY MODE
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08/02/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

BUCKETED

Notice of Abandonment

Application No.

10/586,744

Examiner

JOHN LEE

Applicant(s)

ALLES ET AL.

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 22 December 2009.

(a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.

(b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.

(A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).

(c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).

(d) ☒ No reply has been received.

2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).

(a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).

(b) ☐ The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.

The issue fee required by 37 CFR 1.18 is \$_____. The publication fee, if required by 37 CFR 1.18(d), is \$_____.

(c) ☐ The issue fee and publication fee, if applicable, has not been received.

3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).

(a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.

(b) ☐ No corrected drawings have been received.

4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.

5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.

6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.

7. ☒ The reason(s) below:

The Attorney (Mark C. Comtois Reg# 46,285) confirmed abandonment. If any inquiry of this applicantion, please call the Examiner's direct phone number (571)272-7880.

/JOHN LEE/

Primary Examiner, Art Unit 2618

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.